Frequently Asked Questions (FAQ)		
#	Question/Comment	Response
1	Considering the sensitivity of coding/matching libraries (intellectual property), it is important to protect the vendor's intellectual property and to specify precisely how the SDK will be used and the associated confidentiality in or out the scope of ELFT-07.	This is addressed in Section 6 of the CONOPS. See also the *Application Form*.
2	It will be necessary to include a scope of usage clause such as: The SDK's submitted will be used exclusively for the ELFT07 test; NIST will do its best effort to guarantee the confidentiality of the software, scope of the results, or details of information dissemination other than that specified in the test protocol.	Sections 5 & 6 of the CONOPS address many of these concerns. See also the *Application Form*.
3	The size of the proposed background is very modest. Wouldn't a larger background be preferable?	The principal reason for using smaller datasets is time and logistics. We recognize that some proposed background sizes are not as large as desirable for adequate statistical separation, and that vendors are concerned that adverse statistical fluctuations might rank them unfavorably. We will definitely take statistical significance into account in publishing results.
4	It is important to have vendor review of the draft report before publication and to include vendor comments in the final report (as per FpVTE). Will this be done?	Section 5 of the CONOPS specifically states that this will be done, and outlines the procedure.
5	In order to avoid misunderstanding, it is important that the participant have a precise description on the measurements NIST will perform and how they will be computed. Where and when will this be specified?	Section 4 of the CONOPS provides a start in this direction. This will be augmented in subsequent revisions.
6	There is concern that "AFIS as an SDK" may not be the most appropriate model for testing commercial AFIS software. A typical commercial AFIS application consists of multiple stages that are optimally mapped onto a Systems Architecture with a specific Data-flow Model in mind. Such systems are optimized both in terms of their raw, number-crunching ability and data flow (throughput) requirements.	While recognizing some limitations to the SDK approach, we feel this is the best practical choice. In the past NIST has experimented with testing entire hardware systems, but has found this approach to be problem plagued. We welcome specific suggestions for improving the SDK approach.
7	Can more than one SDK be submitted?	For ELFT07 NIST will allow the simultaneous

		submission of two SDKs, a primary and secondary. It is envisioned that the first (primary) SDK would be a "slow but accurate" version of the software, while the second would be a "fast and but less accurate." (See Section 11.)
8	Can different algorithms be submitted for Phase I and Phase II?	The vendor may submit different algorithms across different phases. This includes Phases I and II.
9	It is suggested that accuracy and speed for searching slap (or rolled or flat) image against latent files be evaluated. A need for this evaluation is described in NISTIR 7377 (Section 2.7, first bullet). However, There do not appear to be provisions for this as of now.	Figure 3 of the revised CONOPS shows that such testing is planned for 2009. This will probably require some modifications in the API. (This is probably true for some of the other tests as well.)
10	It is stated 'NIST will investigate the utility of human assistance in data preparation phase'. Does this mean that each latent images used for test will go through the described 'human assistance' before the image, together with marked ROI, is passed to SDK for a search? Or does this mean that NIST will run two searches for each image, one with the image and ROI while the image may have been cropped and re-oriented, and one with the 'as it is' image without ROI?	For scheduling reasons, as well as simplicity, we would like to avoid regions of interest (ROI) for Phase I. Subsequently, for selected tests we are considering a double test, one with and one without ROIs. The results would be reported separately.
11	Region of interest should not be specified using polygons because there are an inherent number of problems with them.	We agree, and that is why we have switched to a "mask" format. See also Section 10 of CONOPS.
12	Why is ROI not being provided in Phase 1?	For simplicity and schedule reasons.
13	Are all latent images used in test of the same resolution? If yes, is it 500ppi or 1000ppi? If not, how many different kinds?	For the initial testing, all background will be at 500 ppi. Latents will be at either 500 ppi or 1000 ppi. Further "downstream" we envision testing higher resolutions. See Figure 3.
14	It has been stated that "the enrolled fingerprints will consist of rolled impression of ten fingerprints". Could you confirm that (1) No plain impression of any type is included and (2) All images are single impression image?	Plain impressions will not be included in Phases I & II. See also Figure 3.
15	Could NIST provide the information regarding the sources of the latent images used for testing and how the ground truth was established for the testing data?	We are reluctant to be too specific regarding the test samples. The concern is vendors might "over tune" to a specific type of data.
16	It is stated that the matcher should "produce a candidate list of manageable size". What is the 'manageable size'?	We have specified an output candidate list of 50 for phases I and II. A fairly large candidate list is required to ensure good statistics. The term "manageable size" also refers to our concept of candidate list reduction. In

		that case it means eliminating “obvious” mismatches.
17	Will the results of candidate list reduction in second phase of test be reported?	We are still working out the details of this concept. The results will be reported when: 1) the ground rules have been agreed upon based on feedback from vendors and analysis by NIST, 2) vendors have had adequate opportunity for implementing these concepts, and 3) adequate tests have been completed.
18	It is stated that ‘subsequent test may include multi-finger latent search’. Could clarify the meaning of ‘multi-finger search’? Does it mean ‘single latent impressions of multiple fingers’ or ‘multiple impressions of one finger’?	The answer is “yes” to both. Actually three options are under consideration: 1) two or more images that are ***known*** to come from the same finger; 2) two or more images that ***might*** come from the same finger; 3) two or more images that are ***known*** to belong to different fingers of the same subject. See Figure 3, which indicates that such testing would probably not occur before 2009.
19	Disjoint, parallel enrolment and matching should be allowed.	Noted.
20	[The earlier published] requirements on the enrolment speed appear to be somewhat stringent. The CONOPS document states that the software would run a PC with 2GB of memory – which might prove be adequate. However, PC’s with larger main memory and disk space, and with fast disk access, should be considered.	We have relaxed our enrollment and execution times to (basically) accommodate the most conservative estimates supplied by vendors. Regarding the hardware platforms, for now we plan to use what we have in hand.
21	Some of the search times appear to be inordinately long when using extreme values of parameters published by NIST. What does NIST consider to be realistic limits?	It is true that some extreme combinations of parameters suggest execution times of years. Of course these are unrealistic. NIST would be reluctant to plan any single test whose execution time would be six (6) months or more. Most testing should be accomplished in significantly shorter time.
22	As NIST continues to be involved in the M1 standards, is seems unusual that this SDK API would not use the established M1 standards for data interchange. M1-381 supports raw, WSQ, and JPEG2K image file formats, all of which would be usable in this test. Although this isn’t an interoperability test, this is a good opportunity to evaluate and encourage the interchange capability with M1-381. Perhaps NIST should consider using these file formats directly within the test.	Noted. We will consider this in the future. For now, we would like to keep things simple.
23	You stated the software runs on a high end PC (2 GByte RAM). What kind processor it is possibly (i.e., Core 2 Duo ,	Section 9 of the CONOPS briefly discusses the testing platforms. Since NIST has a variety of types at its disposal, we cannot be

	Xenon, Athlon with XX Ghz) ?	overly specific. Also, we do not encourage vendors overly optimizing for a certain type of processor.
24	The NIST 27 database has an error (if this is not already marked): Number 34 is a double entry.	Comment noted.
25	Regarding the maximum size of images, the dimensions of some Validation Data Set (tenprint) images exceed the maximum size of the NIST standard (1.6"x1.5":= 800x756 pixels). Is it intentional?	The tenprint images used to create the Validation Data Set come from SD29, and some do in fact exceed both the "recommended" dimensions and maximum areas specified by NIST Special Pub 500-245 (ANSI/NIST-ITL 1-2000), although this was not intentional and is probably an artifact of the scanning process. However, all of the images used for ELFT07 (including the Validation Data Set) are within the range of dimensions specified by the ELFT07 API specification (section 1.2), which takes precedence in this case.
26	We have found two mutually contradictory statements: (a) "The list should be sorted so as to place the most promising candidate in the number one position." (The second item of the enumeration in the last page of ConOps) (b) "The specific ordering of the candidates is not specified." (The last sentence of the second paragraph in page 8 of API Specification) We are expecting to follow the first statement, but just to make sure, am I correct?	The revised ELFT07 API (March 21st 2007 edition) now states that a fixed length list of 50 candidates shall be returned, and that this list shall be sorted in decreasing order by matcher similarity score.
27	According to API Specification, it is required to let NIST know in advance if an SDK has dependencies on external supporting libraries. What kind of information and in what format do we need to supply to get approved? Our DLL will have several supporting libraries, as was the case in the NIST Fingerprint SDK Testing.	Participants only need to let us know if they are unable to supply us with these libraries themselves. If it is possible to send them along with the SDK, then that is OK. We would however also prefer these extra support libraries to be listed in the documentation provided by the participant.
28	In the section 3.3 of API Specification, it says that complete documentation of the SDK shall be provided. What level of detail does NIST expect? As far as we can tell from the statements that follow, it seems to be satisfactory enough if it contains the definitions of all error and warning codes (and nothing else), as long as the SDK is fully compliant with the specification.	Yes, the supporting documentation need not be elaborate. Documentation of additional error codes and other relevant information that NIST needs to know to install and run the SDK is all that is required.
29	Regarding the NIST provided image extraction routines, we had understood from the documents that these will be provided	We have never specified the precise format for distributing the NIST provided image extraction functions. For the time being, we

	as static library files. However the routines now published on your Website is in form of a DLL file. Just to make sure that we understand correctly, will you be using this same DLL file in the actual test of the SDKs? Or will the SDKs be linked with LIB files to the NIST provided routines?	have chosen to distribute these routines in DLL form, without a static (.LIB) component. This should not be a problem as most compilers we are aware of do not actually need the .LIB to link in a DLL. If this is a problem, please contact the ELFT07 Test Liaison (latent@nist.gov).
30	Why is the ROI parameter for latents not available during extraction? This parameter is much more useful during extraction since it effectively handles segmentation of the latent from the surrounding image. It is of lesser use (or harder to use) during matching.	This change has been made in the revised ELFT07 API (March 21st 2007 edition), and an ROI bitmask is now an optional parameter to enroll_latent().
31	Will all latent probes be oriented 'upright'?	No.
32	Are the filenames unique or will only the path name be unique?	All tenprint filenames passed to enroll_background() will be unique, even absent the full pathname.
33	Will the testing server have dual processors and/or will they be dual Core? If so, will the vendor be allowed to use multiple processors?	Many, but not all, of our test machines are in fact dual processor, and yes the supplied SDK may internally utilize both processors (via threads, etc.) where available. If your SDK has the capability to utilize multiprocessor PC architectures you must inform the ELF07 Test Liaison (latent@nist.gov) of this fact.
34	Will the background data have duplicates (same person, separate instance) such that one probe can have multiple hits?	No, it is intended that each latent have only a single corresponding mate in the background. If duplicates exist it is not intentional, and the probability of this mistake occurring is very low.
35	Is there a maximum image dimension for the latent or exemplar?	Yes, refer to section 1.2 of the ELFT07 API specification for details.
36	It is also not clear the why there is a deadline for withdrawing since it was stated that no vendor names would be released, only numbers, in this first stage.	You are referring to the date on a previous edition of the ELFT07 Calendar labeled "Deadline for Withdrawal From Test" which was the same date as for submission of SDK software & Validate Data set results. This date no longer exists on the current ELFT07 Calendar, and Participants may withdraw at any time prior to the start of Phase II testing (date yet to be announced) in order to have their name removed from the ELFT07 Final Report (written at the completion of Phase II).
37	The ROI mask, as described above in the API, is passed to the SDK at the time of search. This, however, should also take place at the time the latent image is	This change has been made in the revised ELFT07 API (March 21st 2007 edition), and an ROI bitmask is now an optional parameter to enroll_latent().

	enrolled.	
38	The concept of operations document does not describe the stage at which the function "enroll_latent" gets called. At present, there are only two phases described in the test: Phase #1: Enrollment of the background Phase #2: Searching of the latent images vs. the enrolled background It is unclear as to when the driver program makes a call to the "enroll_latent" function. We are concerned about this from a timing standpoint, given that the required times were specified only for the background enrollment and search phases. We would prefer that times are specified for each of the (three) phases, and that the expectation that latent enrollment is a distinct phase, separate from the search phase, is well specified.	The timing requirements for enroll_latent() are given in section 3.4 of the ELFT07 API document. The revised CONOPS document also more clearly illustrates the 3 separate phases of background enrollment, latent enrollment, and latent image search.
39	The API specifications states that all fingerprint images will vary from 150 to 1000 pixels in both width and height. Does this apply to both the enrolled background and the latent images?	No. Refer to section 1.2 of the ELFT07 API for the range of image dimensions of each image type used in Phase I and II of ELFT07.
40	If access to the original images is required during the search process, for example to invoke alternative matching algorithms on specific images, how can this be accomplished? If we store the RAW images to the enrollment directory, this becomes costly in terms of storage and recompression of images leads to lost of image information.	In the ELFT07 API at the top of page 6 there is a note which says: *During subsequent calls to image_search() the SDK is permitted to access the original background images. To support this access, the path information supplied by filenames regarding the original background images should be stored in the proprietary background set in enrollment_dir.* Essentially this is a both a suggestion, and a promise that you WILL be able to access the original AN2 (i.e. compressed) image files during the execution of image_search(), assuming that you've stored the path information from the call to enroll_background() in the enrollment directory.
41	It is unclear whether the first index is 0 or 1. On page 5 it states that it is 1 (maybe this is a typo). Page 8 states that the range shall be between 0 and N-1 inclusive. And the validation dataset uses index 0 for the first record in the readme.txt file. Could you please clarify this critical point?	The statement "between 0 and N-1 inclusive" on pg. 8 of the ELFT07 is **incorrect**. It should actually say "between 1 and N inclusive" because the first background ten-print record shall have an implicit index of 1 (as specified on pg. 5, last line). A change to the Validation Dataset's "readme.txt" file has also been made to reflect the API's indexing scheme starting at 1 for the background ten-print records. Note that the one exception to this rule is the

		case where less than 50 candidates are found, and zeroized CANDIDATE structures are used to "pad" out the candidate list to 50 (as specified on p.8, 2nd par.). In such a case, the index value will actually be zero for these essentially "null" candidates. These cases (null candidates with index = 0) are also exceptions to the rule on pg. 8 (5th par.), about duplicate candidate list entries. Duplicate candidate entries **are** permissible if the ten-print index is 0 (i.e. null candidate entries), otherwise they are forbidden.	
42	I recall reading that all latents would not be 'upright'. There is a rotation range parameter for the probe, however I would think it is more common to have a rotation offset and additionally a rotational range around that offset. Perhaps this could be an addition in the next phase of testing.	The latent image's rotational offset is implicitly upright (0 degrees), and thus the range we specify using the 'rotation parameter' to enroll_latent() is relative to upright. In other words, the actually rotation may be anywhere in the range +/- "rotation parameter" from upright.	
43	Regarding ConOps, Section 8, "Test Data" : For Phase II, will any latents (and/or ten-print fingers) be mirror images?	For Phase I we have included a few mirror images and contrast reversals, on an "experimental basis." No final decision for Phase II has been made.	
44	How does NIST define "mirror image?" Does the result not depend upon the axes about which the image is flipped?	We define the mirror image as "flipping" (reflecting) the image about a vertical line through the image center. (Any other axes of reflection is equivalent to the above, followed by a rotation.)	